

## **Executive Summary**

BFL has been categorized as a Category B project, as the potential adverse environmental and social impacts on population within the Protected Areas or those living around who depend on the PA for their livelihoods or environmentally important areas are site-specific, reversible and can be readily mitigated.

Therefore, to ensure that all BFL funded projects and programs are environmentally and socially sustainable as well as in line with BFL's policies and guidelines, an Environmental and Social Management Plan (ESMP) involving stakeholder participation and timely public disclosure is required.

An Environmental and Social Management Plan (ESMP) for Royal Botanical Park(RBP) describes mitigation measures/good practices at activity level which are required as per the screening protocol. All the screened activities which has potential risks to environment and social management have to prepare ESMP which include environment management and mitigation plans during pre-activity, activity implementation and closing phases. Hence, it contains description of the detailed actions including communities, roles, communication and reporting and monitoring processes required as part of the implementation.

In order to ensure that the issues of all stakeholders are taken into account, it includes a stakeholder engagement plan. The plan includes identification of stakeholders, method of engagement, timing and logistics. It is a requirement for all parks and biological corridors to keep record, reporting, review, auditing and update ESMP yearly as per the planned activities.

The activities that required ESMPs for the year 2025 under Royal Botanical Park are as follows:

1. Construction of Tree canopy walk at Lamperii
2. Maintenance of Visitor Information center

## བཀོད་ཁྱབ་བཅུད་དོན།

འབྲུག་རྒྱལ་ཡོངས་སློབ་ཀྱི་ཆེ་སློག་མ་དདུལ་འདི་ མཐའ་འཁོར་གནས་སྟངས་དང་ མི་ཟླའི་འོས་འབབ་ཅན་གྱི་ལས་འགུལ་གྱི་དབྱེ་ཁག་ ཁ་བ་ (Category B) རྒྱུ་ལྷན་དེ་ཡོད་པ་ཡིན། དེ་ཡང་ ལས་འགུལ་འདི་ལས་བརྟན་ཏེ་ སྤང་སྟོབས་ས་ཁོངས་ནང་སྤྱོད་མའི་མི་སེར་དང་ ཡང་ན་ སྤང་སྟོབས་ས་ཁོངས་ཀྱི་ མཐའ་སྐོར་ཏེ་འཛོལ་སྤང་སྟོབས་ས་ཁོངས་ལྷན་བརྟན་སྤྱོད་མའི་མི་སེར་ ཡང་ན་ གལ་ཅན་གྱི་མཐའ་སྐོར་གནས་སྟངས་ཀྱི་ས་ཁོངས་ཚུ་ལྷན་གཞོན་པ་འབྱུང་ནིའི་ ཉེན་ཁ་ཡོད་པ་ལས་ གལ་སྲིད་གཞོན་པ་འབྱུང་པ་ཅིན་ གཞོན་ཉེན་ཚུ་དམིགས་གསལ་ས་གནས་ནང་རྒྱུང་ཅིག་འབྱུང་ནི་དང་ གཞོན་ཉེན་མར་ཕབ་རྒྱུ་ནི་ དང་ཅ་མེད་ཡང་གཏང་ཚུགས་པ་ཡིན།

དེ་འབད་མ་ལས་ འབྲུག་རྒྱལ་ཡོངས་སློབ་ཀྱི་ཆེ་སློག་མ་དདུལ་ཐོག་ལྷན་ རྒྱུ་སྐོར་འབད་ཡོད་པའི་ལས་འགུལ་དང་ལས་ལྷན་ཚུ་ མཐའ་འཁོར་གནས་ སྟངས་དང་ མི་ཟླའི་གཉིས་ལྷན་བརྟན་གྱི་པན་པ་ཡོད་པ་བཟོ་བ་གི་མ་ཚད་ འབྲུག་རྒྱལ་ཡོངས་སློབ་ཀྱི་ཆེ་སློག་མ་དདུལ་གྱི་སྤྱོད་བྱས་ལམ་སྟོན་དང་འབྲེལ་ ཐབས་ལྷན་ མཐའ་འཁོར་གནས་སྟངས་དང་མི་ཟླའི་འཛོན་སྐྱོང་འཆར་གཞི་འདི་དགོཔ་ཡིན་མ་དུ་ མི་དམངས་གོས་བསྟན་དང་ དུས་དང་དུས་ལྷན་མི་དམངས་ལྷན་ གསང་བ་བཤད་ནི་འདི་དགོཔ་ཡིན།

རང་བཞིན་གནས་སྟངས་དང་མི་ཟླའི་འཛོན་སྐྱོང་འཆར་གཞི་འདི་ནང་ སློབ་ཀྱི་དང་སློག་ཆགས་རྒྱན་ལམ་ཚུ་ནང་ལས་ལྷན་ཚུ་འབད་བའི་སྐབས་ ཐབས་ལམ་ དང་བཟང་སྤྱོད་ཚུ་གསལ་སྟོན་འབད་མ་ཡིན་མ་དུ་ འདི་ཡང་ལས་ལྷན་ཁོང་གཞི་འདི་ནང་ལས་ལྷན་དང་འབྲེལ་ཏེ་ཡིན། གདམ་སེལ་འབད་ཡོད་པའི་ལས་ལྷན་གི་ རང་ལས་ མཐའ་འཁོར་གནས་སྟངས་དང་མི་ཟླའི་གཞོན་ཉེན་ཡོད་པའི་ལས་ལྷན་ཚུ་གི་དོན་ལྷན་ མཐའ་འཁོར་གནས་སྟངས་དང་མི་ཟླའི་འཛོན་སྐྱོང་འཆར་ གཞི་བཟོ་དགོ། འཛོན་སྐྱོང་འཆར་གཞི་འདི་ནང་ ལས་ལྷན་འགོ་མ་བཅུགས་པའི་ཉེ་མ་ གཞི་བཅུགས་འབད་བའི་སྐབས་དང་ མཚུག་བསྐྱུལ་དུ་ མཐའ་འཁོར་ གནས་སྟངས་འཛོན་སྐྱོང་དང་གཞོན་ཉེན་མར་ཕབ་ཀྱི་ཐབས་ལམ་ཚུ་བཅུགས་དགོཔ་ཡིན།

དེ་འབད་མ་ལས་འཛོན་སྐྱོང་འཆར་གཞི་འདི་ནང་ ལས་ལྷན་ མི་ཟླའི་ ལྷ་འགན། བརྟན་དང་སྟན་ལྷ། དེ་ལས་ལྷ་རྟོག་ལམ་ལྷགས་ཚུ་གི་སྐོར་ལས་འགུལ་བཤད་ ཁ་གསལ་ཚུད་དགོཔ་ཡིན། འཛོན་སྐྱོང་འཆར་གཞི་འདི་ནང་ལྷན་ གལ་གཏོགས་འབད་དགོ་པའི་ཁོ་གུད་ཡོད་མི་ཚུ་གི་ཉེན་བཤད་ཚུ་ཚུད་དགོ་པའི་ཁར་ ཁོ་ གུད་ཡོད་པའི་མི་ཚུ་གི་དོན་ལྷན་གཏོགས་འཆར་གཞི་དགོ། གལ་གཏོགས་འཆར་གཞི་འདི་ནང་ ཁོ་གུད་ཡོད་མི་དོན་འཛོན་འབད་ནི་དང་ གལ་གཏོགས་ འབད་ནིའི་ལམ་ལྷགས་ དེ་ལས་གལ་གཏོགས་ཀྱི་དུས་ཚོད་དང་བཅའ་སྤྱོད་ཚུ་ ཚུད་དགོཔ་ཡིན། སློབ་ཀྱི་དང་སློག་ཆགས་རྒྱན་ལམ་ལྷག་ཚད་ཚུ་གི་མཆར་ གཞི་ལས་ལྷན་དང་འབྲེལ་ཏེ་ དན་ཐོ་དང་སྟན་ལྷ། བསྐྱར་ཞིབ། ཆིས་དབྱུང་འབད་ནི། དེ་ལས་ མཐའ་འཁོར་གནས་སྟངས་དང་མི་ཟླའི་འཛོན་སྐྱོང་འཆར་གཞི་ འདི་ལོ་བསྟར་བཞིན་དུ་དུས་མཐུན་བཟོ་དགོཔ་ཡིན།

རྒྱལ་གཞུང་སྐྱོད་ཆས་སློབ་ཁ་ དོན་ལྷན་ལོ་ ༢༠༢༥ རང་མཐའ་འཁོར་གནས་སྟངས་དང་མི་ཟླའི་འཛོན་སྐྱོང་འཆར་གཞི་དགོཔ་ཡོད་པའི་ལས་ལྷན་ཚུ་ཡང་།

༡༥ ལམ་པེ་རེ་ལྷན་གི་རྒྱ་ཚམ་ཆས་བཟོ་སྟེ་ ལམ་འགུལ་འབད་ནིའི་ གཞི་ཉེན་མཐུན་རྒྱན་དང་ ལམ་འགུལ་ཚུ་ བཟོ་བསྟན་འབད་ནི།

༢༥ ལམ་པེ་རེ་ལྷན་ སློབ་ཁའི་བརྟན་དོན་སྟེ་བ་ཉམས་བཅས་འབད་ནི།

# Bhutan for Life

## *Environmental and Social Management Plan for Royal Botanical Park (2025)*

### 1. Introduction

#### (A) Project Background

The Bhutan for Life (BFL) project aims to establish a robust network of protected areas and biological corridors that safeguard human well-being, conserve biodiversity, and enhance climate resilience in Bhutan. This initiative provides a 14-year financial bridge to enable the immediate improvement of Bhutan's protected area management for climate resilience. It also facilitates the swift delivery of mitigation, adaptation, and biodiversity benefits while allowing the country to progressively increase its self-financing capacity.

#### BFL Objectives:

- Support Bhutan's carbon neutrality by expanding forest and vegetation cover within the Protected Area System (PAS).
- Enhance socio-economic well-being of communities within and around the PAS through climate-informed natural resource management.
- Preserve stable, thriving, and diverse populations of key species, contributing to national and global biodiversity goals.
- Strengthen organizational, institutional, and financial capacities for effective management of the PAS.

The BFL initiative comprises five key components aligned with these goals. These components are broken down into 16 milestones (or outputs) and over 80 detailed activities.

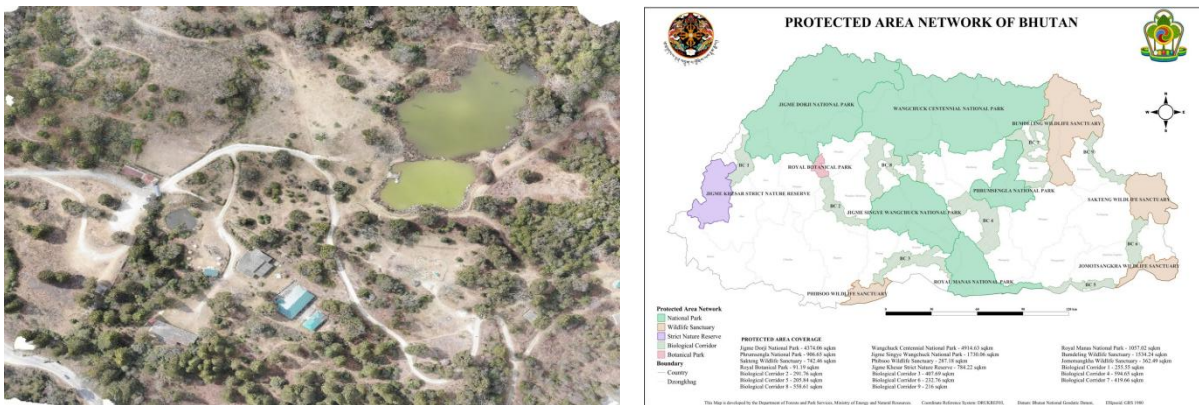


Fig 1: Location of Royal Botanical Park

## **(B) Scope of ESMP**

The preparation of this Environmental and Social Management Plan (ESMP) is essential to effectively manage environmental and social impacts through specific mitigation actions. These actions are aligned with the requirements of WWF's Social Safeguards Integrated Policies and Procedures (SIPP), the project's Environmental and Social Management Framework (ESMF), and applicable national legislation and regulations. The ESMP outlines the environmental and social baseline conditions along the routes of the proposed segment of the project. It summarizes the potential impacts associated with the proposed activities and specifies the management measures necessary to mitigate any potential adverse effects.

Implementation of this ESMP will be carried out by the designated BFL focal persons in each park authority (PA) and biological corridor (BC). Additionally, contractors engaged by each PA/BC will ensure compliance with the ESMP throughout the project.

## **(C) Purpose of ESMP**

This Site-Specific Environmental and Social Management Plan (ESMP) is a project-specific document that outlines the environmental and social protection measures necessary to mitigate and minimize adverse impacts. The primary purpose of the ESMP is to ensure that the environmental requirements and social commitments associated with the project are integrated into its implementation and operational phases and are effectively managed.

The specific objectives of this ESMP are as follows:

- Reduce environmental, social, and health risks arising from project activities.
- Ensure all project activities align with the relevant laws of the Royal Government of Bhutan (RGoB) and WWF's safeguard operational policies and guidelines.
- Avoid environmental harm caused by individual subprojects or their cumulative effects.
- Promote beneficial environmental and social outcomes through project activities.
- Ensure that proposed mitigation measures are practical and economically viable.
- Develop an Action Plan to ensure that mitigation measures are implemented and monitored effectively.
- Actively involve stakeholders in the preparation and implementation of project activities, addressing their concerns comprehensively.

## **(D) Applicable law, policies, and regulation**

This ESMP is developed by following the guidelines as set forth in the BFL's ESMF.

Applicable RGoB laws and policies include the Constitution of the Kingdom of Bhutan, 2008; legislation on land and moveable property (Land Act of Bhutan 2007; Land Rules, 2007; The Moveable Cultural Property act of Bhutan, 2005); legislation and regulations on forests and protected areas (National Environment Protection Act, 2007; Forest and Nature Conservation Act of Bhutan, 1995; Forest and Nature Conservation Rules and Regulations of Bhutan, 2017; National Forest Policy, 2011); legislation on water and waste prevention (Water Act of Bhutan, 2011; Waste

Prevention and Management Act, 2009); legislative requirements on environmental assessment (Environmental Assessment Act, 2000 and Regulations on the Environmental Clearance of Projects, 2001); and other relevant laws (The Local Government Act of Bhutan, 2009; Livestock Act of Bhutan, 2001; The Biodiversity Act of Bhutan, 2003; The Pesticides Act of Bhutan, 2000; The Penal Code of Bhutan, 2004; National Access and Benefit Sharing (ABS) Policy (Draft), 2014).

WWF's safeguards policies that are relevant to this project are as follows: Policy on Environment and Social Risk Management; Policy on Protection of Natural Habitats; Policy on Involuntary Resettlement; Policy on Indigenous Peoples; Standard on Pest Management; Policy on Accountability and Grievance System; Standard on Physical Cultural Resources; as well as general standards on occupational and community health and safety and on energy efficiency.

In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirements of the latter are more extensive. All project activities should fully comply both with the RGoB's Regulations on the Environmental Clearance of Projects and with the procedures and mitigation measures prescribed in this ESMF. In case the WWF's SIPP requirements are more extensive, strict, or detailed than the RGoB legislation and policies, the former will apply to all project activities.

With regard to social impacts, the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP refer to the status of non-title holders and informal land use, and the commitment to participatory decision-making processes. First, according to the WWF's SIPP, all users of land and natural resources (including people that lack any formal legal ownership title or usage rights) are eligible for some form of assistance or compensation if the project adversely affects their livelihoods. The RGoB laws only recognize the eligibility of land owners or formal users to receive compensation in such cases. Second, the WWF's SIPP requires extensive community consultations as part of the development of various safeguards documents and during project activities. RGoB legislation does not include similar requirements. For the purposes of the BFL project, the provisions of the WWF's SIPP shall prevail over the RGoB legislation in all cases of discrepancy.

## **2. Environmental and Socio-Economic Conditions**

### ***(a) Geological and topographical conditions***

Geographically, the Royal Botanical Park (RBP) lies predominantly within Punakha Dzongkhag, with parts of its area extending into Thimphu Dzongkhag. It is currently managed by the Divisional Forest Office, Wangdue. The park spans four gewogs from two Dzongkhags: Toebesa, Kawang, Kabesa and Dagala. Adjacent to the park, there are 136 households with an approximate population of 1,140 people. The nomadic community of Dagala Gewog represents the sole ethnic group in the area, and Dzongkha is the primary spoken language among the local communities.

The RBP is situated at an elevation range of 2,100 – 3,750 meters above sea level (masl). Geographically, it forms the core of the "tri-junction" of the Sinchula, Helela, and Dochula hill

ranges. The park features a Rhododendron garden, a visitor information center, and various nature trails, such as the Rhododendron Walk (1 km) and the Serchu Nature Trail (1 km). Additionally, major trekking routes extend from the park, including the Dochula–Thadana trek and the Ancient Trek Route.

A notable feature of the park is Baritsho Lake, which holds religious significance, with local people offering votive prayers and offerings. The park is located in Lamperi, approximately 30 km (a 20-minute drive) from Thimphu. Four key areas of the park fall under Lamperi's jurisdiction: Hongtso in Thimphu and Begana, Menchuna and Kabesa in Punakha. Agriculture farming remains the primary livelihood for the communities residing in these areas. RBP is renowned for its rich biodiversity and serves as a habitat for several flagship species, including the endangered Royal Bengal Tiger and the charismatic Red Panda.

#### ***(b) Climatic conditions***

The Royal Botanical Park boasts a unique and diverse climate that provides a nurturing environment for a wide variety of plant species. With an annual rainfall of 1470 millimeters, the park enjoys a relatively wet climate that supports lush vegetation and vibrant flora throughout the year. The ample rainfall contributes to the park's rich biodiversity, fostering the growth of different plant species. The consistent rainfall ensures that the botanical park remains green and lively, offering visitors a stunning display of colors and textures. During winter snow covers higher elevation places providing scenic beauty. The climate at the Royal Botanical Park is characterized by its moderate temperatures and high humidity, creating a comfortable environment for both plants and visitors alike. The combination of rainfall, temperature, and humidity levels provides an ideal setting for the thriving plant life within the park, making it a haven for botany enthusiast and nature lovers. Overall, the climate at the Royal Botanical Park plays a crucial role in shaping the park's ecosystem, supporting a diverse range of plant species and creating a picturesque and inviting atmosphere for visitors to explore and enjoy.

#### ***(c) Hydrological conditions***

Based on the field assessment, there are two streams and a lake within the park. The water from these streams is used as a source of drinking and irrigation water by downstream villages. The drying up of the lake over time due to the formation of sinkholes, sedimentation, and deterioration of water quality are major concerns for the management. Therefore, proper research on the causes and quality of the water needs to be conducted, and appropriate measures prescribed.

#### ***(d) Flora and fauna***

Vegetation survey covered all the forest types along the altitudinal gradients from lowest (1750 m a.s.l.) at Kabjisa to the highest (3705 m a.s.l.) which was recorded at Thadana top. Random sampling method was used for laying out plots in the designated national grids falling under Lampelri Park. Random sampling was based on the presence of different forest types and different aspects of the park. The plots were established at a distance of 500 meters apart. Total of 34 plots were laid in 10 different national grids falling inside the Park.

Vegetation survey was conducted on three levels (Fig.2, A & B); (1) trees and shrub layer enumeration inside 20 x 20m and (2) ground/herb layer enumeration inside 2 x 2m, all free-standing woody plants (including trees, lianas and shrubs) with a stem diameter at breast height (DBH) of > 2 cm was recorded. Area of Occupancy (AOO) of each species in % was recorded inside herb plot (Fig.2B). In addition, altitude, aspect and slope were also recorded at each plot.

A total of 93 trees and shrubs species belonging to 32 families were recorded inside 8 forest types with 4 major life form groups namely: Evergreen trees, Deciduous trees, deciduous shrubs, Evergreen shrubs as shown below in Fig 3. All the life form groups form contrasting physiognomic patterns along altitudinal gradients. The Evergreen trees consist of 78%, deciduous trees 18%, deciduous shrubs 2% and evergreen shrubs 2% respectively. The slope from Lungchutse to Dochula-Totokha corresponds to western Himalayan floral elements such as *Quercus oxyodon*, *Q. glauca*, *Q. lamellosa*, and *Castanopsis hystrix* etc at the mid-altitudes. At Lamperi, the presence of tree species like *Tetracentron sinensis* belongs to the monotypic east Asiatic families of *Trochodendrales* which is found only in limited parts of the humid Himalaya and in the world considered as ancient relict angiosperm species. Another one is a *Decaisnea insignis*, a species limited to Himalayas and western China. The conservation and management of such interesting forest types deserve priority. Around 120 acres of abandoned

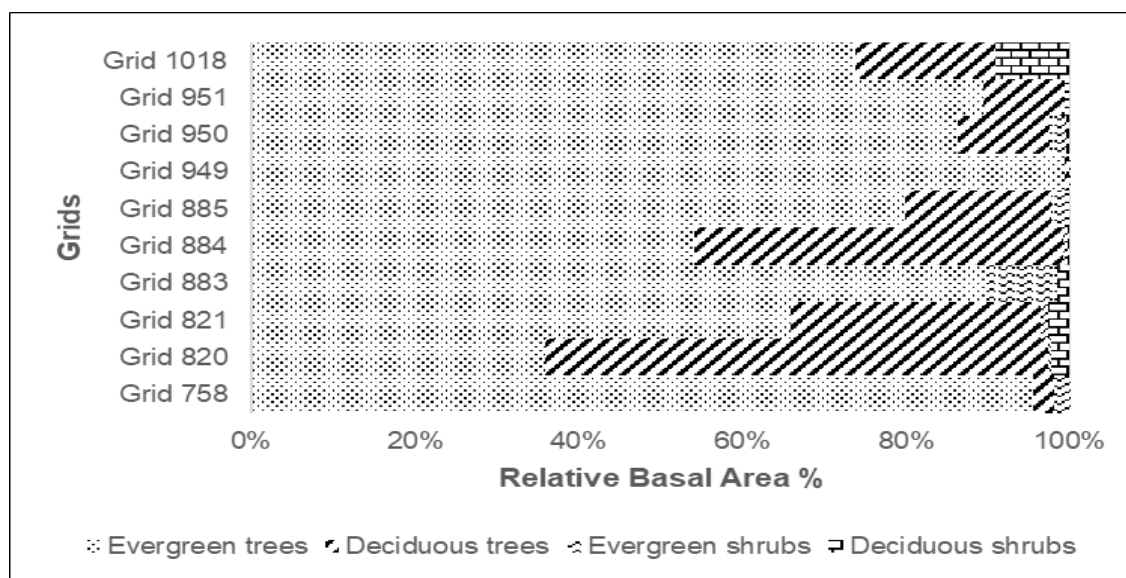


Fig 2: Floristic composition of major life-forms of Trees and shrubs layer

Wasabi Pilot Project has undergone drastic change, especially the ground vegetation and profuse regeneration of *Symplocos* species were observed along the canopy openings. Vegetation in the park is mostly dominated by *Castanopsis tribuloides*, *Lyonia ovalifolia*, *Quercus glauca*, *Rhododendron arboreum* and *Symplocos* sp. in the mid elevations. Intermediate zone between 1860 m and 2540 m was dominated by three broad-leaved species of *Q. lanata*, *Q. griffithii* and *R. arboreum*. *Q. lanata* was abundant at the upper, *Q. griffithii* in the middle, and *R. arboreum* at the lower parts of the vegetation zone. Those species are very important for the formation of leaf litter and perhaps Menchuna to Lamperi stretch is one of the most important sites for collection of leaf litter to 3 Dzongkhag namely: Thimphu, Punakha and Wangdue. In the upper reaches the dominant

species were *Juniperus recurve*, *Abies densa*, *Tsuga dumosa* and *Rhododendron barbatum*. Tshangkaphug was once heavily logged by the erstwhile Bhutan Logging Corporation and mostly the logged spaces are slowly replaced by *Juniperus recurva* sprouts. Stretch of primary forest from Tshangkaphug to Thadana was lost and what we see today is the secondary forest. Tshangkaphug is also said to be one of the worst infested areas by forest pathogens, especially the infestation by Adelgid on hemlock trees. Unprecedented harvesting of Juniper trees and leaves for incense takes place in the areas and however the presence of Juniper was very significant at grid 949. The Rural House Building Timber and firewood for Toeb Gewog is mostly met from the periphery of the park area and the communities collect fodder and leaf litter for the domestic animals. The surrounding forests provide a bountiful livelihood option for the communities living by the side of the park area. Refer to the species composition table showing Relative Basal Area %(RBA%) arranged from highest to lowest of the vegetation report for further details.

The ground vegetation was composed of 77 families with 34 were tree regeneration, 56 shrubs, 132 herbs and 30 perennial fern species. Tree regeneration consists of 9.53%, shrubs 29.79%, herbs 42 % and perennial fern 18.68% respectively.

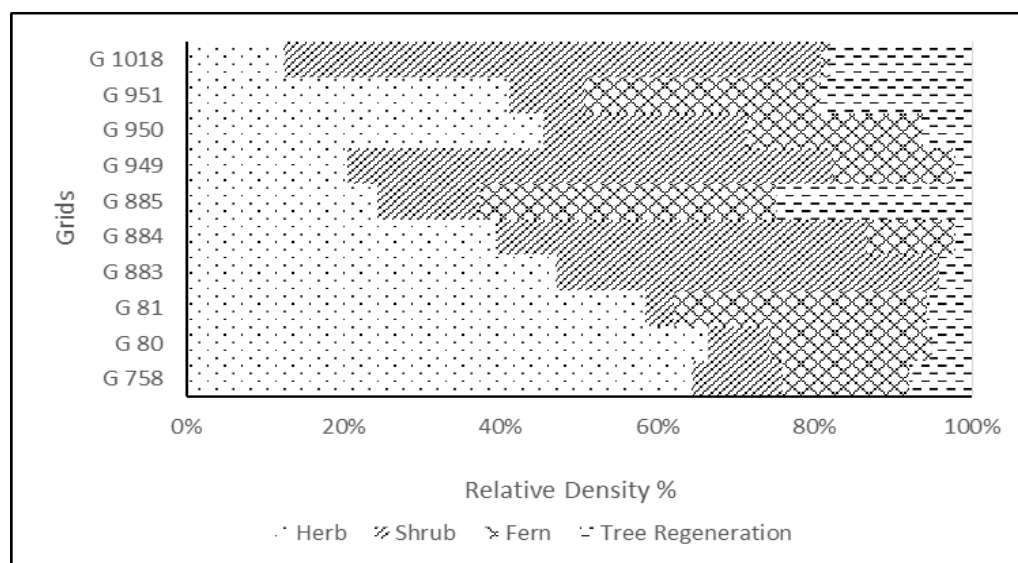


Fig 3: Floristic composition of the ground vegetation

The result revealed the ground vegetation was mostly dominated by *Cautleya spicata*, *Isodon kurzii*, *Plagiogyra* sp., *Carex filicina*, *Pilea umbrosa*, *Senecio scandens*, *Digitaria ciliaris*, *Begonia urophylla*, *Berberis aristata*, *Lonicera angustifolia*, *Yushania microphylla* and *Rhododendron barbatum* etc. The tree regeneration mostly consists of *Castanopsis hystrix*, *Rhododendron falconeri*, *Castanopsis tribuloides* and *Symplocos* sp.



### (e) Orchid Diversity

The park is also known for being very rich in diversity of an orchid species and thus has the utmost host species for the epiphytic orchids. A total of 42 species of epiphytic orchids from 21 genera were recorded during the survey (Kezang Dawa, 2015). Amongst all species, *Bulbophyllum* genus was found to be relatively high in species quantity with seven species under its genera, followed by *Dendrobium* species with six species. The least recorded species being *Gastrochilus*, *Liparis*, and the *Ornithochilus* species. The highest species abundance and diversity observed at the elevation ranging from 2151-2350m were *Bulbophyllum yoksunense*, followed by *Bulbophyllum retusuculum* and *Dendrobium longicornu* respectively. The species such as *Ceologyne cormbosa* and the *Pleione praecox* species shift in their dominance towards the higher reaches of the park. (Annexure attached)

### (f) Fern Diversity

The fern and their allies were surveyed in June 2008 by the park to find out fern diversity and their extent of coverage. The results from that survey shows that there were 24 families, 46 genera and 114 species (Annexure 1) comprising of epiphytes, lithophytes and terrestrial ferns indicating rich diversity of ferns in the park within an altitude ranging from 2000 to 3600 masl.

The area is dominated by *Polypodiaceae* family with 7 genera and 23 species followed by *Aspidiaceae* family with 4 genera and 19 species and the least by *Gramminataceae*, *Plagiogyriaceae*, *Gliechenaceae*, *Bortychiaceae*, *Equisetaceae*, *Lindsaeceae*, *Cryptogrammeaceae* and *Dennstaedtiaceae* with 1 genera and 1 species each only. *Diplazium esculentum* contribute towards the socio-economic development of the communities through the sale of the product in vegetable vendor in Punakha, Wangdue and Thimphu urban dwellers. (Annexure attached)

### (g) Mammal

A total of 20 mammal species from 13 families were recorded through transect surveys and camera traps. Among these families, Felidae showed the highest dominance in species richness ( $S = 4$ ), followed by *Bovidae*, *Cercopithecidae*, *Sciuridae* and *Cervidae*, each with a species richness of two ( $S = 2$ ). The families with the least species richness were *Moschidae*, *Canidae*, *hystricidae*, *Muridae*, *Mustelidae*, *Prionodontidae*, *Suidae*, and *Ursidae*, each with only one species recorded ( $S = 1$ ) (refer to Figure 1). The complete list of captured mammals along with their conservation statuses is provided in Table below:

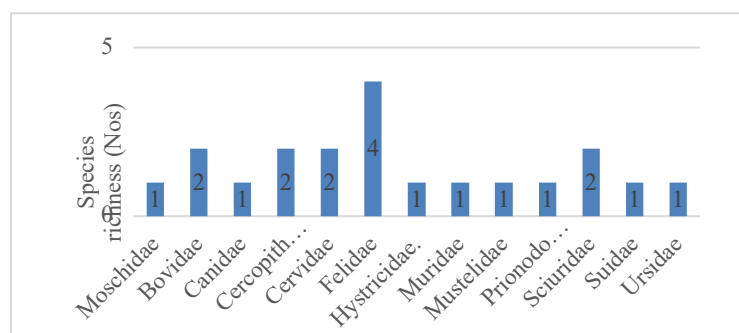


Fig 4: Species richness

#### ***(h) Birds***

The park recorded 232 species of birds in 2014 and the current study recorded 52 additional birds to the existing checklist totaling to 284 species of birds. We also recorded 1 EN species, 2 NT and 157 LC species. RBP is serving as the critical habitat for birds. SAC indicates that there is still room for discovering new species if we explore more across the other season in future. Park is home for many globally threatened species like Satyr Tragopan, Yellow-rumped Honeyguide, Ward's Trogon, Steppe Eagle and Hill Partridge which needs special conservation effort. If time permits, repeated surveys during different seasons will help track more species and bird diversity will continue to increase.



*Fig 5: Picture of fauna species*

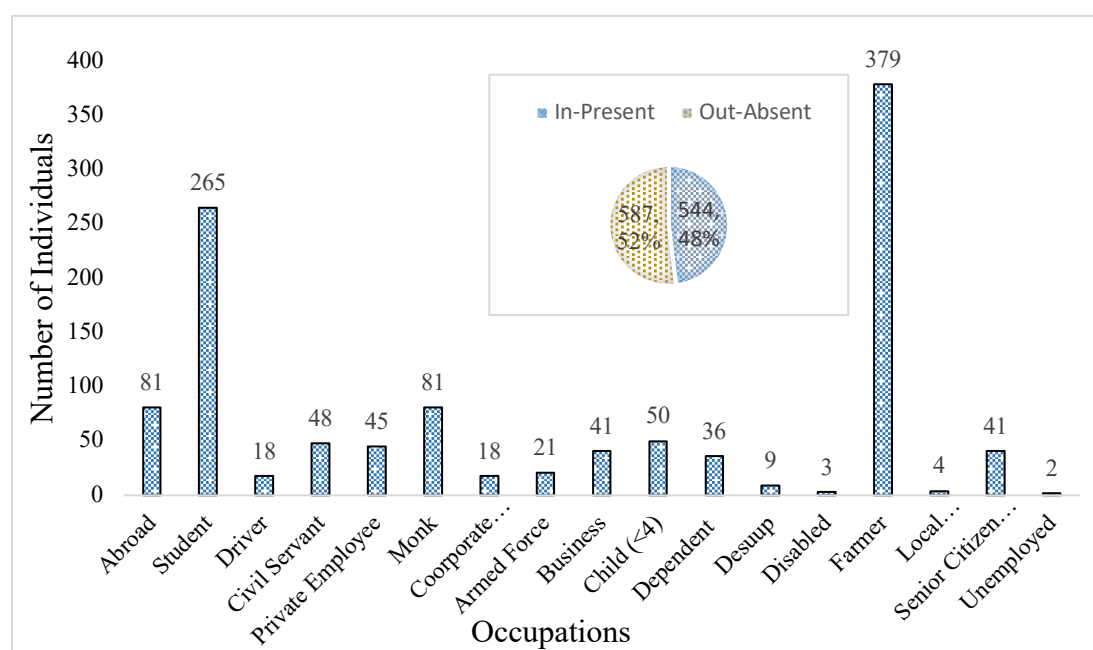


*Fig 6: Some of the flowers recorded at the Park*

**(i) Socio-economic conditions**

The socio-economic survey was carried out using a simple random sampling technique. Yamane's (1967) method was employed to determine the household sample size for the survey. A sufficient sample size with a 95% confidence level (0.05 margin of error) was considered to avoid biases. Households were randomly sampled from all the villages, ensuring they were not too close together and widely distributed to obtain diverse information on all social aspects.

There are five gewogs in Thimphu and Punakha Dzongkhags, which either fall inside the park boundary or depend on the park for natural resources. Out of 1,917 households in these five gewogs, 335 households depend on the natural resources from the RBP. This figure excludes eight migratory households from Wangdro and Dungdro villages under Dagala gewog, who own yaks and use the RBP as a winter grazing ground as shown below:



*Fig 7: Number of individuals against the occupation*

**Activities that are planned in RBP in 2025 include the following:**

**1. Activity: Construction of Tree Canopy Walk**

- **Budget:** Nu. 8.325M
- **Location:** Inside the recreational area (RBP)

**Activity Description:**

There is considerable potential to enhance the park's current offerings in a way that significantly advances biodiversity conservation while simultaneously serving as a dynamic platform for public education. To unlock this potential, the park requires immediate improvements and the expansion of essential infrastructure. These upgrades will not only uplift the overall visitor experience but also increase the park's capacity to generate revenue. The additional income generated from these enhanced facilities will provide a stable financial foundation, ensuring the long-term sustainability and effective management of the park.

Moreover, by broadening the park's attractions, we can appeal to a wider audience, boost domestic and international tourism, and further showcase Bhutan's exceptional biodiversity and rich cultural heritage. This initiative is closely aligned with Bhutan for Life's innovative financing mechanisms and represents a strategic step toward long-term conservation goals.

As part of this project, the following activities will be implemented:

1. *Design and Engineering:* Development of detailed structural designs for all new infrastructure.
2. *Site Preparation:* Includes clearing of vegetation, careful selection of trees to be preserved or removed, and groundwork for upcoming construction.
3. *Foundation and Support Structures:* Installation of heavy-duty anchors, reinforced cement concrete (RCC) foundations, and tensioning systems to ensure stability and durability.
4. *Walkway Construction:* Construction of a tree canopy walk, including a suspension bridge, connecting planks, safety nets, and one elevated platform for scenic views and educational displays.
5. *Safety and Testing:* Provision and training on the use of safety equipment to ensure all installations meet safety standards.
6. *Installation of Low-Impact Lighting:* Eco-friendly lighting to enhance visibility and safety without disrupting local wildlife.
7. *Construction of Restrooms:* Additional restroom facilities to cater to increased visitor numbers.
8. *Seating Along the Walkway:* Comfortable seating areas at intervals along the walkway for rest and observation.
9. *Entry and Exit Facilities:* Construction of clearly defined and aesthetically integrated entry and exit points.

Importantly, the proposed facility will be constructed within the designated recreational area of the park, ensuring minimal environmental and social impact.

Before the commencement of any on-site work, the contractor will receive a comprehensive orientation on Occupational Health and Safety (OHS) standards. All workers will be provided with appropriate personal protective equipment (PPE), and strict adherence to safety protocols will be mandatory throughout the project duration.

To minimize environmental impact, the contractor will be required to construct a dedicated waste disposal site to manage and segregate all construction-related waste responsibly. The final disposal of collected waste will be carried out in an authorized landfill site. The contract agreement will explicitly prohibit the disposal of any waste material into nearby rivers or natural water sources, and workers will be thoroughly briefed on this policy.

To support the workforce, a designated area within the park will be allocated for the construction of temporary shelters to house laborers during the project. It is anticipated that the contractor will employ approximately 10 to 20 workers over the course of the project. Existing park infrastructure, including drinking water facilities and restrooms, will be sufficient to meet the needs of the workers; thus, no additional installations for water or sanitation are required.

This carefully planned and sustainably executed project is expected to not only enhance the ecological and educational value of the park but also contribute to Bhutan's broader goals of conservation-led tourism and sustainable development.

***Some of the possible social and environmental impacts are:***

- Disturbance to the wildlife
- Waste from construction activities
- Occupational health and safety of the workers

**Activity 2: Maintenance of Visitor Information Centre at Royal Botanical Park**

- ***Budget:*** Nu. 1.00M
- ***Location:*** inside the recreational area

**Activity description:**

The Visitor Information Centre (VIC), originally constructed in 2004 alongside other key recreational infrastructure, has long served as a vital gateway for guests to the park. However, after two decades of continuous use and exposure to natural elements, the facility is now in urgent need of comprehensive maintenance. Critical structural and electrical upgrades are necessary to restore its safety and functionality. These include complete rewiring of the electrical systems, re-roofing to prevent further water damage, and replacing the deteriorated ceiling, all of which are essential to bringing the facility up to current standards.

Strategically situated within a popular recreational park, the VIC plays a central role in supporting the diverse stream of visitors the park welcomes year-round. These visitors range from nature enthusiasts and families enjoying dry picnicking to school groups and researchers engaged in

educational and ecological activities. As the primary point of contact for park information, safety guidelines, and logistical support, the VIC is integral to ensuring a positive and enriching experience for both domestic and international guests. With a recently approved budget in place, there is renewed optimism about upgrading the Visitor Information Centre (VIC) to a modern and fully functional standard. The renovation work will be tendered out and implemented by the contractor. The contractor will be responsible for hiring laborers to carry out the maintenance work at the Lamperi Recreational Park.

To support the workforce, the park will allocate a designated area for the construction of temporary sheds to accommodate the laborers during the project. It is anticipated that the contractor will engage between 10 to 15 workers for the duration of the renovation.

Prior to the commencement of the project, the contractor will be thoroughly briefed on Occupational Health and Safety (OHS) standards. They will be required to ensure that all workers are provided with and consistently use proper safety gear while on-site. The contractor will also be instructed to construct a dedicated waste disposal site, ensuring that all construction-related waste is managed and disposed of responsibly. The procurement of all necessary materials and resources for the renovation of the VIC will be handled by the contractor.

This initiative represents more than just an infrastructure upgrade—it is a direct investment in improving the overall visitor experience and in preserving the park's standing as a premier destination for outdoor recreation and environmental learning. By enhancing the VIC, we aim to create a safe, informative, and welcoming environment that reflects the park's commitment to quality, safety, and sustainability.



*Fig 8: Present status of VIC*

*Some of the possible social and environmental impacts are:*

- Occupational health and safety of the workers
- Generation of waste from construction activities

#### **4 Environmental and Social Impacts and Mitigation Measures**

##### **1. Tree Canopy walk**

- Waste generation during the construction
- Occupational health and safety of the workers

##### **2. VIC maintenance**

- Waste generation during the construction activities
- Occupational health and safety of the workers

Therefore, for all the potential adverse impacts of the environment and social related to each activity, mitigation measures have been prepared as below:



## 5 Activity: Construction of Tree Canopy Walk.

Potential Impact	Impact Scale	Proposed mitigation measures	Responsible Party	Cost (million)
<b>Activity 1: Construction of Tree Canopy Walk</b>			<b>Nu.</b>	
Waste: generation of waste as a result of activities	Short term  Minor	<p>During the Construction:</p> <ul style="list-style-type: none"> <li>• Proper containers/waste bins should be provided at the construction site and ensure waste is collected back home while returning.</li> <li>• Dumping of waste in the sides the forest shall be monitored and ensure that waste is not left at the site by the labours.</li> <li>• All waste should be collected by the workers.</li> <li>• All construction materials should be covered during transportation to avoid waste dispersion.</li> <li>• Construction site, transportation route and materials handling sites should be water-sprayed on dry and windy days.</li> </ul> <p>After Construction:</p> <ul style="list-style-type: none"> <li>• All the waste shall be removed from the construction site and disposed of in the designated landfill.</li> </ul>	BFL focal person in RBP,GBCL and Contractor	Agreement will be drawn between the contractor and BFL focal



Workers' health and safety	Short term Minor	<ul style="list-style-type: none"> <li>• Comply with the worker's health and safety guidelines;</li> <li>• Ensure regular health screening for the worker's pre and during construction activities;</li> <li>• Ensure that no underage workers or children are engaged</li> <li>• Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers;</li> <li>• Comply with the OHS guideline</li> <li>• Ensure that workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment access to training, job assignment, promotion, and disciplinary practices;</li> <li>• Implement a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns.</li> <li>• Brief the workers about maintaining safety</li> <li>• Provide with safety gloves, boots, helmets and facemask.</li> </ul>	BFL focal person in RBP/ GBCL and Contractor	To be incorporated in the Worker's contract agreement From the activity cost
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### Activity 2: Design and Develop ecotourism infrastructure at RBP: VIC maintenance

Potential Impact	Impact Scale	Proposal mitigation measures	Responsible Party	Cost ( Million)
<b>Activity 2: Maintenance of VIC</b>				<b>Nu.</b>
Waste management during construction	Short term Minor	During the Construction: <ul style="list-style-type: none"> <li>• Proper containers/waste bins should be provided at the construction site and ensure waste is collected back home while returning.</li> <li>• Dumping of waste in the sides the forest shall be monitored and ensure that waste is not left at the site by the labours.</li> <li>• All waste should be collected by the workers;</li> </ul>	BFL focal person in RBP Contractor	From the Activity cost, And workers' agreement

		<ul style="list-style-type: none"> <li>• All construction materials should be covered during transportation to avoid waste dispersion.</li> <li>• Construction site, transportation route and materials handling sites should be water-sprayed on dry and windy days.</li> </ul> <p>After Construction:</p> <ul style="list-style-type: none"> <li>• All the waste shall be removed from the construction site and disposed of in the designated landfill.</li> </ul>		
Workers' health and safety	Short term  Minor	<ul style="list-style-type: none"> <li>• Comply with the worker's health and safety guidelines;</li> <li>• Ensure regular health screening for the worker's pre and during construction activities;</li> <li>• Ensure that no underage workers or children are engaged</li> <li>• Ensure decent work conditions, including an appropriate salary, working hours, accommodation and food for workers shall be provided to all workers;</li> <li>• Ensure that workers are employed on the principle of</li> <li>• equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, and promotion, termination of employment or retirement, and disciplinary practices;</li> </ul> <p>Provide workers with an incidents report book and ensure that they are aware of the projects grievance redress mechanism and can use it to raise workplace concerns.</p> <p><i>After completion of work:</i></p> <p>*All waste shall be removed from the respective sites and disposed of in a designated landfill</p>	BFL focal person in RBP	To be incorporated in the Worker's contract agreement From the activity cost

## **5. ESMP Implementation Arrangements**

The implementation of project activities will be carried out by the BFL focal person in RBP. The focal person will be responsible for compliance with all procedures outlined in this ESMP, as well as compliance with any requirements to obtain clearances, permits, approvals, or consent documents from relevant authorities and stakeholders.

This ESMP should be part of the contract that the PA will sign with the Contractor(s) for implementation of the planned activities in RBP in 2025-2026. The Contractor is obligated to perform all proposed preventive or mitigation environmental and social measures in this plan and to keep the evidence of any documents related to applying these measures (e.g., letter asking the municipality for disposal of inert waste, records on OHS information session performed for all workers before start of activities, all developed EHS plans, etc.). An OHS information session should be organized by the Contractor for all workers prior to the start of the project activities and prior to any specific tasks with high health risks.

The RBP Supervising Engineer needs to monitor the implementation of proposed measures by the Contractor and the Contractor's subcontractors with visual checking, reviewing the records of evidence that the measures have been applied and asking the Contractor to apply the measures as soon as possible. Non-compliances should be recorded and the Report on any non-compliances should be reported to the ESS consultants immediately, and the ESS consultants will report it to the PCU (M&E Officer). Each non-compliance should be closed with appropriate measure/s and the evidence should be kept.

Disbursement of project funds to the PA will be contingent upon their full compliance with the safeguards requirements.

## **6. ESMP Monitoring Arrangements**

The BFL focal person in RBP will closely monitor the implementation of all planned activities and the required mitigation measures and ensure that they fully comply with this ESMP and with the terms and conditions included in the environment clearances issued by RGoB's national authorities. RBP is also fully responsible for the compliance of all external contractors and service providers working in the RBP area with the safeguards requirements outlined in the ESMP.

The monitoring of activities under this ESMP will be carried out in the following manner:

Sl. No	Activities	Monitoring team	Timeline		Location	Means of verification
			Start	Complete		
1	Construction of Tree Canopy walk	BFL focal	July 2025	June 2026	RBP, Lamperi	Monitoring reports and pictures.
		ESS focal	December 2025	June 2026		
		Report to PCU on Bi-annual	December 2025	June 2026		
2	Maintenance of VIC	BFL focal	September 2025	March 2026	RBP, Lamperi	Monitoring reports and pictures.
		ESS focal	December 2025	March 2026		
		Report to PCU on Bi-annual	December 2025	June 2026		

## 7. Capacity Need and Budget

Activities under this ESMP will be implemented by the BFL focal person, supervising engineer, and a contractor that will employ workers as mentioned in the contract agreement.

- *The budget for each of the activities is:*

Sl. No	Activity	Amount (Nu)	Budget for ESS mitigation
1	Construction of Tree Canopy Walk at Lamperi	8.325M	0
2	Maintenance of Visitor Information Center	1.00M	0

## 8. Consultation and Disclosure Mechanisms

This ESMP has been prepared in a participatory manner with the implementing agency. Since there is no community within the Park, a consultation should be carried out with the Gewog Administration as soon as the budget is released to inform the local authority regarding all planned project activities to solicit their opinions and enable them to question proposed mitigation measures. The main issues raised by the Gewog Administration during the consultation will be recorded and the detailed minutes of the consultation meeting should be attached to this ESMP, along with a full list of participants (disaggregated by gender and age).

The full English version of this ESMP, as well as an executive summary in Bhutanese, should be disclosed on the website of MoENR, BFL and WWF, Bhutan Program. Hard copies of the ESMP should also be available at the PA Management Office and at the PCU Office.

## **9. Stakeholder Engagement Plan**

The local authority (Gewog Administration) near RBP shall be engaged throughout the implementation of these activities.

- For all construction activities - one consultation meeting will be organized during the intervention period, and subsequent consultations have to be held annually (these can be combined with consultations for other BFL or non-BFL activities).
- For activities that have no direct impact on communities, consultation meetings will be organized once a year (can be combined with consultations for other BFL or non-BFL activities)
- Design and Develop Eco-tourism Infrastructure: April 2025
- VIC maintenance: April 2025

The BFL focal person should submit the official minutes of consultation meetings (along with a list of participants, disaggregated by gender and age) to ESS officer within one week after the completion of the consultation. The ESS officer will submit the consultation reports to the PCU (M&E officer) one week after their receipt. The PCU (M&E officer) will report to the Secretariat on a semi-annual basis.

## **10. Grievance Redressal Mechanisms**

This ESMP and its mitigation measures are required to be disclosed to the communities for 30 days prior to the start of implementation of activities.

In addition, the BFL focal point is responsible for making local communities aware of the grievance mechanisms: the BFL-specific grievance mechanism, WWF's grievance mechanism, and the GCF Independent Review Mechanism.

### ***BFL-specific Grievance Mechanism***

A grievance redressal mechanism (GRM) is in place to address any grievances arising from the implementation of BFL activities, on resources, non-performances of project obligation including safeguards, violation of law and/or corruption, project governance and implementation, fair access and benefit sharing, stakeholder engagement, labour-related issues and incidents, gender related issues and others.

If the stakeholders have any grievances related to the project they can report their grievances via letter, phone call or verbally to the nearby geog or forest offices. The report can also be sent to

the BFL PCU office or WWF office. The specific brochure for GRM is attached in the annexure for any grievance related to implementation of the project activities.

Since, project is located with Royal Botanical Park(RBP), the GRM brochure of RBP will be used as per annexure 1:

### ***WWF Grievance Mechanism***

A grievance can be filed with the Project Complaints Officer (PCO), a WWF staff member fully independent from the Project Team, who is responsible for the WWF Grievance Mechanism and who can be reached at:

Email: [SafeguardsComplaint@wwfus.org](mailto:SafeguardsComplaint@wwfus.org)

Mailing address:

Project Complaints Officer

Safeguards Complaints,

World Wildlife Fund

1250 24th Street NW

Washington, DC 20037

Stakeholders may also submit a complaint online through an independent third-party platform at <https://secure.ethicspoint.com/domain/media/en/gui/59041/index.html>.

### ***GCF Independent Review Mechanism***

The Independent Review Mechanism (IRM) provides recourse to those affected or who may be affected by GCF projects. Complainants can find information on filing a complaint and proceed to file a complaint on the GCF IRM website: <https://irm.greenclimate.fund/case-register/file-complaint>.

### **Annexure 1: BFL GRM Brochure**

## **Annexure 2 -**

### **BFL: OCCUPATIONAL HEALTH AND SAFETY STANDARDS**

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Implementing entities should hire contractors that have the technical capability to manage the occupational health and safety issues of their workers, extending the application of the hazard management activities through formal procurement agreements.

This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. It is based on the IFC's Environmental, Health, and Safety Guidelines (April 30, 2007)<sup>1</sup> and the Occupational Health and Safety Guidelines of Bhutan's Construction Development Corporation Ltd., which relies on the national Regulation on Occupational Health, Safety and Welfare 2012, Regulation on Working Conditions 2012 and Labour Act 2007, and in compliance to Sl. No. 21 of Regulation on Occupational Health, Safety and Welfare 2012.

#### **1. General Facility Design and Operation**

##### ***Integrity of Workplace Structures***

Permanent and recurrent places of work should be designed and equipped to protect occupational health and safety:

- Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- Buildings should be structurally safe, provide appropriate protection against the climatic conditions, and have acceptable light and noise conditions.
- Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- Floors should be level, even, and non-skid.
- Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

##### ***Severe Weather and Facility Shutdown***

- Workplace structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge (e.g., in case of earthquake).

##### ***Workspace and Exit***

- The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.

##### ***Fire Precautions***

The workplace should be designed to prevent the start of fires. Other essential measures include:

- The workplace shall be provided with adequate means of protection and escape in case of fire.

- The workplace shall be provided with adequate number of relevant fire extinguishers.
- Workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction.
- Smoking, lightening, or carrying of matches, lighters or smoking materials shall be prohibited within and around the construction sites.
- All other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.
- At every workplace adequate provision of water supply for firefighting shall be provided and maintain.
- Facilities shall be equipped with firefighting equipment (e.g., fire extinguishing bottle). The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Manual firefighting equipment shall be easily accessible and simple to use.
- Fire extinguishers and emergency alarm systems that are both audible and visible should be in place.
- Fire exits should be identified and marked in Dzongkha and English- all workers should be made aware of the fire exits.

#### ***Lavatories and Showers***

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility (one for at least one for every 20 workers). Toilet facilities should also be provided with adequate supplies of water and soap and also be connected to sewerage system.

#### ***Potable Water Supply***

- Adequate supplies of clean drinking water should be provided to workers at the work site.

#### ***Clean Eating Area***

- Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.

#### ***Lighting***

- Workplace should receive adequate natural light and if required supplemented with artificial illumination to promote worker's safety and enable safe equipment operation.
- Emergency lighting of adequate intensity should be provided in case of failure of the power line.

#### ***Safe Access***

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access.
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access.



- Covers need to be provided where ever necessary, if there is risk of falling of overhead object.
- Measures to prevent unauthorized access to dangerous areas should be in place.

### ***First Aid***

- The employer should ensure that qualified first-aid can be provided at all times. A sufficient number of first aid boxes or cupboards shall be provided and maintained so as to be readily available during all working hours, provided that the distance of the nearest first aid box or a cupboard shall be not more than 200m from any working place.
- First aid kits include all equipment outlined in Annex 1 to these Guidelines.

Each first aid box or a cupboard shall be distinctly marked "FIRST AID"

### ***Air Supply***

- Workplace should have adequate ventilation for fresh air

## **2. Information Provision on Occupational Health and Safety (OHS)**

The Contractor is responsible to hold an information session to familiarize all workers with the OHS procedures specified in these guidelines, in order to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow workers.

3. The information session should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

## **3. Physical Hazards**

Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity.

### ***Rotating and Moving Equipment***

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:

- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations.
- Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

## ***Noise***

- No worker should be exposed to a noise level greater than 90 dB(A) for a duration of more than 8 hours per day without wearing ear plugs/ear muffs.
- Exposures to impulsive or impact noise shall not exceed 140dB(A).
- For every 3 dB(A) increase in sound levels from the permissible limit of noise, the 'allowed' exposure period or duration should be reduced by 50 percent.
- Where it is not practicable to reduce the noise, the employer must limit the duration of time persons employed or working in the workplace are exposed to the noise so that such persons are not exposed to excessive noise.
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible.
- Periodic medical hearing checks should be performed on workers exposed to high noise levels.

## ***Vibration***

In any workplace where persons are at work in any process or operation which involves exposure to vibration which may constitute a risk to their health, it shall be the duty of the employer to provide, so far as is reasonably practicable, effective means to reduce the vibration.

## ***Electrical***

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:

- Marking all energized electrical devices and lines with warning signs
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibit
- Establishing "No Approach" zones around or under high voltage power lines
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work
- Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices such as gloves, rubber shoes, and safety belts, ladders,

earthing devices, helmets, line testers, hand lines whichever is relevant for protecting him/her from mechanical and electrical injury.

### ***Eye Hazards***

Solid particles from a wide variety of industrial operations, and/or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:

- Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice.
- Where machine or work fragments could present a hazard to transient workers or passers-by, extra area guarding or proximity restricting systems should be implemented, or PPE required for transients and visitors.

### ***Welding / Hot Work***

Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include:

- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station.

### ***Working Environment Temperature***

Exposure to hot or cold working conditions in indoor or outdoor environments can result temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- Providing temporary shelters to protect against the elements during working activities or for use as rest areas
- Use of protective clothing
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks.

### ***Ergonomics, Repetitive Motion, Manual Handling***

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds (adult man- 50kg, adult female-25kg)
- Selecting and designing tools that reduce force requirements and holding times, and improve postures
- Incorporating rest and stretch breaks into work processes, and conducting job rotation
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions

### ***Working at Heights***

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- Proper use of ladders and scaffolds by trained workers
- Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines
- Appropriate training in use, serviceability, and integrity of the necessary PPE
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall

### ***Illumination***

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed. Controls should include:

- Use of energy efficient light sources with minimum heat emission
- Undertaking measures to eliminate glare / reflections and flickering of lights
- Taking precautions to minimize and control optical radiation including direct sunlight.
- Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled
- Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class Laser should be applied to minimize risks.

### **Personal safety equipment for workers**

All workers are equipped with the following personal safety equipment: helmet, gloves, ordinary boots and reflective vest.

Workers that are exposed to dust should also be provided with eye protection glasses and face mask. Workers that are exposed to noise should be provided with ear plugs. Workers that need to work in the dark should be provided with hand and cap lamps.

Workers are instructed regarding safety equipment as follows:

- Always wear complete set of protective wear.
- Do not wear loose clothing, such as overhang shirt, jackets, mufflers etc.
- Tuck shirt and jacket well.
- Secure helmet with belt under the chin.
- Tuck the bottom sleeves of trouser inside safety boot.
- Dress with reflector

### **Standards for workers' accommodation<sup>2</sup>**

#### ***1. General living facilities***

- The location of the facilities is designed to avoid flooding or other natural hazards
- The living facilities are located within a reasonable distance from the worksite.
- Transport is provided to worksite safe and free if the accommodation is reasonably far from the worksite.

- The living facilities are built using adequate materials, kept in good repair and kept clean and free from waste and refuse.

## ***2. Drainage***

- The site is adequately drained.

## ***3. Heating, air conditioning, ventilation and light***

- Living facilities are provided with adequate heating, ventilation, and light systems including emergency lighting.

## ***4. Water***

- Workers have easy access to a supply of clean/ potable water in adequate quantities.
- The quality of the water complies with national/local requirements and is regularly monitored.
- Tanks used for the storage of drinking water are constructed and covered to prevent water stored therein from becoming polluted or contaminated.
- The quality of the drinking water

## ***5. Waste water and solid waste***

- Wastewater, sewage, food and any other waste materials are adequately discharged in compliance with national and/or international standards and without causing any significant impacts on camp residents, the environment or surrounding communities.
- Specific containers for waste collection are provided and emptied on a regular basis.

## ***6. Rooms/dormitories facilities***

- Rooms/dormitories are kept in good condition. They are aired and cleaned at regular intervals.
- Rooms/dormitories are built with easily cleanable flooring material.
- Rooms/dormitories and sanitary facilities are located in the same buildings.
- Residents are provided with enough space.
- The number of workers sharing the same room/dormitory is minimized.
- Doors and windows are lockable and provided with mosquito screens when necessary.
- Separate sleeping areas are provided for men and women.
- A separate bed is provided for every worker and use of double deck bunks is minimized
- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- Adequate facilities for the storage of personal belongings are provided.
- Separate storages for work clothes and PPE and depending on condition, drying/airing areas are provided.

## ***8. Sanitary and toilet facilities***

- Sanitary and toilet facilities are constructed from materials that are easily cleanable.
- Sanitary and toilet facilities are cleaned frequently and kept in working condition.

- Toilets, showers/bathrooms and other sanitary facilities are designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
- Separate sanitary and toilet facilities are provided for men and women.
- Toilet and shower facilities are conveniently located and easily accessible.
- Toilet facilities are environmentally friendly (e.g., pit toilet) and sewage is not disposed into the worksite.
- Open defecation in the vicinity of project sites should be prohibited.
- An adequate number of hand wash basins and showers/bathrooms facilities are provided.

### ***9. Cooking and laundry facilities***

Cooking and laundry facilities should be available for workers at the worksite or in close vicinity to it. These facilities should be kept in clean and sanitary conditions.

#### **Annex 3. Contents of first aid box or cup-boards**

The first aid boxes or cup-boards shall be distinctively marked with white cross on a green background and shall contain the following equipment:

1. Small sterilized dressings (12)
2. Medium size sterilized dressings (6)
3. Large size sterilized dressings (6)
4. Large size sterilized burn dressings (6)
5. (1/2 oz.) Sterilized cotton wool (6 packets)
6. (2oz.) Bottle containing a two per cent alcoholic solution of iodine (1)
7. (2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label (1)
8. Roll of adhesive plaster (1)
9. A snake bite lancet (1)
10. Torch light (1)
11. Pair of scissors (1)
12. Tablets Aspirin ( 5gms) 2 dozen
13. Burn Ointment (2 tubes)
14. Dettol (2 phial, about 2 ozs)
15. Bandages 4 inches wide
16. Bandages 2 inches wide
17. Triangular bandages (2)
18. Packets of safety pins (1)
19. A supply of suitable splint

## Annexure II – BFL specific GRM Brochure

